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Washington Caruthers Kerr

The Farmers' Advocate of the 1870's

History Series No. 1

School of Agriculture and Life Sciences
North Carolina State of the
University of North Carolina at Raleigh

WASHINGTON CARUTHERS KERR

THE FARMERS' ADVOCATE OF THE 1870's

By Dr. Rhett Y. Winters

History Series No. 1

School of Agriculture and Life Sciences

North Carolina State
of the University of North Carolina at Raleigh

November, 1964

WASHINGTON CARUTHERS KERR

THE FARMERS' ADVOCATE OF THE 1870's

By Dr. Rhett Y. Winters
Director, N. C. Agricultural Experiment Station, 1925-1937

"Prof. Kerr was in birth, in education, and in his life work closely identified with the State; and as far as I am aware he is almost the only native-born North Carolinian who has as yet attained a position of eminence in the ranks of science."

Thus spoke Prof. J. A. Holmes, a contemporary scientist and successor to Prof. W. C. Kerr as State Geologist, in a memorial address before the University of North Carolina faculty in 1887. 1/

During the 1870's, Prof. W. C. Kerr was the State Geologist and Professor of Geology at the University of North Carolina. He was also a member of a team, which included University of North Carolina President Dr. Kemp P. Battle, that led in the fight to establish the N. C. Department of Agriculture and the N. C. Agricultural Experiment Station.

North Carolina Native

By training and experience W. C. Kerr was well prepared to understand the primary problems of the agricultural community in North Carolina during the 1870's. He was born on a small farm in Guilford County. When orphaned at an early age he was adopted by a friend of the family, Rev. Washington Caruthers, a Presbyterian clergyman who guided his early schooling. He graduated from the University of North Carolina with high honors in 1850. At the Lawrence Scientific School in Cambridge, Mass. he studied geology, biology, chemistry, mathematics and engineering under the foremost educators of the time. He earned

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1/ "A sketch of Prof. Washington Caruthers Kerr, with biography," Journal of the Elisha Mitchell Scientific Society. Vol. 4, Part II, July-December, 1887.

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his college expenses by serving as one of the computers on the staff of the Nautical Almanac in Cambridge, Mass.

As State Geologist and Professor of Geology at the University, Kerr had traveled over most of the regions of the State on horse-back and by foot. His evenings were spent in farm homes along the way as a welcomed guest. He sought to relate his knowledge of geology and chemistry to soil formation and use. The sale of spurious and worthless fertilizers he considered a serious drain on the farm resources and had acted as an expert witness before the court of law to help a farmer recover loss due to the purchase of inferior fertilizer. 2/

Highly Regarded Agriculturist

When a prominent lawyer-farmer of Halifax County declined the invitation to make the University commencement address on Agricultural Education in 1876, Prof. Kerr was assigned this duty.

President Battle gave further evidence of his confidence in Kerr when he wrote: "As it was absolutely essential to deal fairly with the Land Grant appropriation the President sought and obtained leave to visit some agricultural and mechanical colleges which had the reputation of being successful. Fortunately W. C. Kerr, State Geologist, whose wide acquaintance with scientific men much facilitated the investigations, accompanied him. They visited Tufts College at Boston, the Massachusetts Institute of Technology, the Sheffield School under control of Yale University, the Weslyan University where experiments were being carried on by Prof. W. O. Atwater, the Connecticut State Fair; Williams College, and the New Jersey Agricultural and Mechanical College of Rutgers College." 3/ The tour was made in 1876.

Following the visit to other institutions, President Battle declared that the University was carrying out the Act of Congress of 1862 by theoretical teaching of the

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2/ Legislative Papers, General Assembly 1876-1877, State Archives.

3/ The History of the University of North Carolina by Kemp Plummer Battle. p 122.

branches of learning relating to agriculture and the mechanic arts. He recognized the desirability of work on "cultivated fields and orchards, the raising of cattle, together with experiments on all such subjects," but reported that such subjects would have to await special funds for the purpose. No time was lost in planning requests to the 1876-77 General Assembly for the establishment of a Department of Agriculture and Experiment Station, previously made an objective in the State Constitution.

Special Meeting Called

In furtherance of this purpose President Battle "obtained a joing meeting of the State Grange, of representatives of the University, of the several agricultural societies of the State, of the Patrons of Husbandry, and the State Geologist. Dr. Columbus Mills, Master of the State Grange, was called to the chair.

The conference was addressed by President Battle, Professor Red, Professor Kerr, Col. L. L. Polk, General R. F. Hoke and Col. J. M. Heck. On motion of President Battle, a committee was instructed to lay the matter before the Generaly Assembly. The chairman appointed President Battle, Dr. W. C. Kerr, Col. L. L. Polk and General R. F. Hoke and on motion the chairman was added to the committee. President Battle wrote the report.

Report to Governor

The committee's report which was presented to Governor Zebulon B. Vance under date of January 3, 1877 reads as follows:[4]

> "Sir:
>
> I have the honor to present to you the accompanying memorial of a conference of delegates of the several Agricultural Societies and the Patrons of Husbandry with

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[4] Legislative Papers of the General Assembly of 1876-77 in the State Archives.

the request that you will honor them by its transmission to the General Assembly.

Your Obedient Servant
Columbus Mills
Chairman of Conference

To The General Assembly
of North Carolina

The undersigned on behalf of a conference composed of committees of the Patrons of Husbandry and the North Carolina and other Agricultural Societies of the State and a committee of the Faculty of the University respectfully show unto your Honorable Body, as follows: There is urgent necessity for measures being taken to promote the interests of the farmers of North Carolina.

In 1870, of the people of the State over ten years old, 269,338 were engaged in farming, while only 82,061 were in all other pursuits. Our annual agricultural productions amounted to $57,845,940; the manufactures to only $19,021,327. The number of farmers was over three times as much as all other occupations compared.

The agricultural interest of the State is its greatest interest. It is therefore with some confidence that this appeal is made to your Honorable Body for relief from a grievous burden. This burden is fraud in commercial fertilizers.

It is not necessary to go with much detail into proofs that such frauds exist. All intelligent men know the fact from their own experience or the experience of their neighbor. In a trial in the Circuit Court of the United States in this State, it was shown by the State Geologist that more than half of the fertilizer, the subject of the suit, was pure sand, and yet the court held that the purchaser was bound to pay the price agreed. At the Connecticut Experiment Station it was found that an article introduced by an agent at $55.00 per ton would be dear at $5.00. Another valued at $27.00 was hardly worth $4.00, and a third contained elements actually poisonous to vegetation.

Similar frauds have been discovered in other states. North Carolina is more liable to them now because being driven from some states by proper legislation fraudulent articles are forced into those unprotected with such efficient legislation. Only recently as we are creditably informed, a cargo, prohibited from landing in Savannah by the laws of Georgia was immediately transferred to a North Carolina port.

The laws of North Carolina for the prevention of such frauds has not been entirely successful, because of the great aversion of farmers to appeal to the courts for redress of their grievances. The uncertainty of results, the loss of time, the certain expense which cannot be covered by even a favorable verdict, prompt them to submit to imposition. Means must be provided to prevent the evil in order to make protection effectual. Such means can be secured at a cost insignificant compared with the evil sought to be remedied, leading to the enforcement of the law requiring a qualified analysis and attended with other important advantages.

They have been tried in other countries, in Germany, in France, in England, in Austria, in some of the United States and they have enabled farmers to know what fertilizing elements with as much certainty as flour or cloth.

Those means are the establishment of what are known as agricultural experiment and fertilizer control stations, where experts in chemistry, in laboratories provided with suitable apparatus, analyse soils and manures for people, promptly detect and expose fraud, and by regular bulletins inform the people of the results of their labors. It has been found that honorable manufacturers and dealers willingly cooperate with the Stations by authorizing them to inspect their wares at all times, without notice. They have been found most useful also, not only in informing the farmers what kind of manures their crops require but also by themselves experimenting on plants and animals have made valuable discoveries in regard to their nutrition and growth. They have so commended themselves to intelligent agriculturist that they are now considered indespensible in the best communities of Europe and in some of the States of this Union. From the establishment of the first Station in Saxony in 1851 they have rapidly increased to about eighty in number in continental Europe alone.

The University of North Carolina has fitted up a chemical laboratory, furnished with the best apparatus. As the University has all of the appliances proper for carrying out the work, have the grounds by their character, and location suited for carrying out agricultural experiments and is a State institution, it seems plain that such a Station as desired should be established at Chapel Hill.

For making the Station useful it will be necessary to have in charge an expert analyst, whose whole time and attention shall be devoted to its work. Other expenses must be incurred besides his salary. The State of Connecticut has given for the purpose $2800 per annum which has been supplemented by $100 per annum contributed by a member of the State Agricultural Board.

Your memorialist ask for an appropriation by the State of $2500 as being a reasonable amount. This amount they feel sure will save our people tens of thousand dollars every year, and by this action the General Assembly will be carrying into effect a mandate of the Constitution to establish a Department of Agriculture in connection with the University (Section 14, Article 14 of the Constitution).

Your memorialist hopes this memorial will receive the favorable consideration of the General Assembly and thus the State will hereafter be saved a drain which has materially led to the impoverishment of the people.

Respectfully submitted for the
Conference
Columbus Mills, Chairman''

The memorial not only includes some of Prof. Kerr's contentions as to the needs for a fertilizer control department and experiment station, but records his experience with the ineffectiveness of current North Carolina law as a fertilizer control measure. It is of interest to note that the General Assembly of 1876-77 sought further information from Prof. Kerr as a guide to the establishment of the new department and effective law.

Kerr As An Advisor

"On Dec. 11, 1876, W.C. Troy, Senator-Chairman presented a joint resolution of the Senate and House of Representatives concerning that the State Geologist be and is hereby required to furnish the General Assembly at as early date as possible with all such statistical information as in his opinion will be of service in the organization of the Department of Agriculture.

"Resolve further that, he, also be requested to furnish such information as in his opinion will be of advantage in the enactment of such laws as will furnish protection to our farmers from the great impositions they are now suffering in the purchase of spurious and worthless fertilizers."5/

This joint resolution was approved prior to the conference of the Grange and agricultural societies representatives. Prof. Kerr's report in response to the request was submitted to the General Assembly Jan. 31, 1877 and was published as a public document.6/ Excerts from the original manuscript of 20 legal size pages will serve to establish the substance of his recommendations.

Prof. Kerr estimated that not less than $2,000,000 was spent annually for fertilizers by North Carolina farmers and that the amount due to fraud was at least $1,000,000, an amount easily preventable by adequate legislation. He

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5/ Legislative Papers of the General Assembly of 1876-77 in the State Archives.

6/ Report of State Geologist concerning the establishment of a State Department of Agriculture. N. C. Pub. Doc. 32, Session 1876-77, 12 pp., W. C. Kerr. The original manuscript in State Archives, Box 996.

recounted the past experience of England, France and Germany in which "fraudulent practices reached such a point as to almost destroy the trade."

He declared that the "French method of dealing with the problem is not only the most direct and most effective but is also by far the cheapest, because it cuts up the evil by the roots." The French fertilizer control station set up regulations and penalties supported by law and dealt directly with distributors of fraudulent products.

"In Germany where a knowledge of the principles of agriculture are much more widely diffused the protection of the farmer is left to his own spontaneous action, partly in his individual capacity and partly in association in the numerous agricultural societies of which there are more than 200, all affiliated with the National Society and under the direction of a National Board of Agriculture.

"In England the control is administered by the Royal Agricultural Society of England and the Highland Agricultural Society of Scotland, patterned in part like the German system."

Professor Kerr explained that the State of Georgia had adopted the essential features of the French system of control whereby the State provides the laboratory and chemical skill to prohibit the sale of worthless materials at any price.

The "State of Connecticut has adopted the German plan with promising results. The State established an Agricultural Station where analyses are made without cost to the farmers and it is hoped through the cooperation of the State Board of Agriculture, the agricultural and associated committees of farmers, as well as honest manufacturers, to succeed in expelling fraudulent articles from the State."

He pointed out that "the law of this State (North Carolina) on the subject is very inadequate and indeed almost inoperative because of the same fatal vices already referred to, the want of an Agricultural Station or State Laboratory devoted to the special work. I believe no case has ever arisen under the law, and it is practically impossible to establish a fraud."

By action of the Senate on February 27, 1877 the Department of Agriculture, Imigration and Statistics and for the encouragement of Sheep Husbandry was established. Section 12 of this Act provided for an Agricultural Experiment and Fertilizer Control Station.

Functions of New Station

While fertilizer control was given most emphasis as the pressing need, several other functions were recommended, such as the introduction and cultivation of new food crops, new fiber crops, and the production of silk as demonstrated by the State Geologist at Fayetteville, N. C. in 1876. The new department could encourage emigration and would promote crops that would contribute to industrial development of the State. Examination of the legislative papers bear witness to his efforts in the establishment of the State Department of Agriculture. Few acts of the North Carolina General Assembly have been planned and guided by such a background of knowledge and previous experience.

Professor Holmes wrote of him: "Prof. Kerr advertised the resources of North Carolina as no one before him had done, and he worked whole-heartedly for the good of the State, but the times were evil and for several years he shared the common fate of many public officials in the South. His motives were misrepresented, his character assailed, his abilities questioned and his work maligned."

Dr. H. B. Battle,7/ son of President Battle and director of the State Agricultural Experiment Station 1887-1897, reported that the representative of Buncombe County in the General Assembly proposed a resolution to abolish the office of State Geologist. When this failed to carry, he proposed a second resolution which would limit the salary of the State Geologist to $1200 per year during the tenure of Professor Kerr. His salary at the time was $1500 per year plus an allowance for house rent in Raleigh.

Throughout the early years of its existance, the primary function of the Agricultural Experiment Station was in testing fertilizers and other materials bought by farmers. After this issue was resolved, the researchers could then go on to other activities. But this early control work helped to establish a base from which North Carolina could grow into one of the most important crop producing states in the Nation.

7/Reported in private conference during the celebration of the 50th anniversary of the N. C. Station in 1928.

Agricultural Experiment Station

North Carolina State of the University of North Carolina
at Raleigh

R. L. Lovvorn, Director of Research

Bulletins of this station will be sent free to all citizens who request them.

Charles William Dabney

Educator, Administrator and Scientist

History Series No. 2

School of Agriculture and Life Sciences
North Carolina State University at Raleigh

CHARLES WILLIAM DABNEY

EDUCATOR, ADMINISTRATOR AND SCIENTIST

By Dr. Rhett Y. Winters
Director, N. C. Agricultural Experiment Station, 1925-1937

When the American Alumni Association requested Hampden-Sydney College to name and sketch the life of a prominent alumnus of the college who was a "specific shining example of a college product," Hampden-Sydney nominated Charles William Dabney. Dr. J. D. Eggleston, President Emeritus of the College, agreed to present the case. Dr. Eggleston had known Dabney since childhood and had worked under him and with him for many years.

"Born in Hampden-Sydney Virginia June 19, 1855; graduated at Hampden-Sydney College in 1873 with the degree of Bachelor of Arts; in order to have funds to enter the University of Virginia taught a country public school, where he prepared boys for college; entered the University of Virginia in 1874 remaining three years.

"Following the war of 1861-65, and the depleting days of Reconstruction, the South was financially prostrate. Young Dabney's father, a minister and classical scholar, who had been Stonewall Jackson's Chief-of-Staff, and Dr. L. L. Holliday, his science teacher at Hampden-Sydney, impressed upon the young man the necessity for upbuilding the South by the development of its material and human resources. He therefore determined to specialize in the natural sciences, to which he had had only an introduction at Hampden-Sydney.

"He spent three years at the University of Virginia, studying chemistry, physics, and mathematics. He was fortunate in having as his teacher in chemistry the famous John W. Mallet (an Englishman who had studied in Germany and who had introduced laboratory work at the University). As Dabney intended to study in Germany he studied French and German under Schale de Vere, who spoke both languages. Diplomas not being given at that time, he received certificates of graduation in all these subjects. To prepare himself for public speaking, he did active work in the Jefferson Literary Society, as he had done at Hampden-Sydney.

"After one year of teaching the sciences at Emory and Henry, Virginia, where he introduced laboratory work in chemistry and physics, he studied at the University of Gottingen and during the holidays, attended lectures at Berlin, under Woehler, then considered the foremost chemist in Germany; under Hoffman, under Von Helmhotz and under Du Bois Reymond. With great physical strength and health, with a mind as strong as oak, he put forth his utmost efforts to improve every minute in his studies in organic and inorganic chemistry; in mineralogy, and gave time to the study of agricultural chemistry. He took his degree of Doctor of Philosophy, magna cum laude, in two years.

"In Europe Dabney had visited and studied at the Agricultural Institute in Gottengen and had added to his knowledge of scientific field work in agriculture by studying the reports of the Director of the Rothamstead Farm in England." 1/

Charles Dabney returned home to pursue the purposes outlined by his father and teacher. There were few men in this country with such basic training in the sciences relating to agriculture at that time and few positions for such men except as professors in a small number of institutions of higher learning. Industries had not yet learned the value of such men and salaries were very low. Few public leaders and very few politicians were aware of the opportunities for improving agriculture through the application of the natural sciences. Some thought the hoe and the plow more important instruments than the test tube for solving problems of the farmer.

In North Carolina public and political opinion invisioned the new land grant college as a trade school for farmers and mechanics. But President Battle of the University called attention to the need for higher education for farmers which would lead them to take their positions with other learned professions such as doctors and lawyers. 2/

With this objective in mind Dr. Battle could have

1/ The Record of the Hampden-Sydney Alumni Association, Vol. 19, No. 4, July, 1945.

2/ The Head and the Hand. Commencement Address before the graduating class of the University of South Carolina, 1886.

recognized the value of a man like Dabney, who was offered the position of professor of chemistry in the University. At the same time (1880) Dabney was also considering an offer which would make him Director of the Experiment Station and State Chemist. He chose the latter and recommended his friend Francis P. Venable for the professorship of chemistry.

The Educator

Dr. Dabney was first and last a teacher and he delighted in teaching what he knew. His first job after graduation from Hampden-Sydney was to teach in a rural school where he prepared boys for college. The training at the University of Virginia was followed by the teaching of science at William and Henry College in Virginia. He took particular care to train his assistants in the Experiment Station for the work they were to do.

Dr. Dabney received great recognition for his stand and pursuit of universal education in the South, as reported by Dr. Eggleston:

"And came his opportunity to serve the South in a great and lasting way. In 1898 a Conference for Education in the South had been held at Capon Springs, West Virginia, the leaders of which were men of the North who wished to do something for mountain whites and the Negroes of the South. To this and the subsequent conferences, educators and ministers of the South were invited to give their views as to what should be done. Principal H. B. Frissell, of Hampton Institute, Virginia, one of the leaders of the conference, knowing of Dr. Dabney's constructive work, and of his interest in education of all the children of the people, visited him in Knoxville in the winter of 1902 and asked him to attend the next conference.

"Dr. Dabney frankly declined. He told Dr. Frissell that the conference would get nowhere by meeting at Capon Springs and by trying to solve the educational problems of the people of the South by attempting to confine its interests to the Southern Negro and mountain whites. What the South needed, he said, was to be told the truth as to its great lack of adequate public schools for both races; and its duty to provide by taxation for these. At Dr. Frissell's request, Dr. Dabney stated that he would get an invitation for the conference to meet in some strategic city in the South; and upon Dr. Frissell's further request, Dr. Dabney agreed to make an address, setting forth the actual conditions and the "way out". He secured an invitation from Winston-Salem, North Carolina, for the next meeting of the conference, and made the principal address. Great publicity was given to the meeting, and representative educators were present from every Southern state.

"When he went to Tennessee to take charge of the University at Knoxville, (1887) he saw that the University and other higher institutions in the state, and that Tennessee itself, could get nowhere in the life of the nation without adequate schools. This led to a study of public education, not only in Tennessee but in every state in the South and that study was done with the Doctor's invariable thoroughness.

"And so when he spoke at Winston-Salem he spoke as having knowledge of the actual conditions. No such factual statement had ever been presented in so plain and truthful manner by a man who was himself a native of the South. What the people of the South needed, he said, was to be told the conditions, which were appalling, and he described them; the remedy, which was the taxation of themselves for their own schools, and all the children, white and Negro, must be included. Donations from philanthropists of the North were needed and would be welcome, but the problem was more than private philanthropy could undertake. Upon request from Dr. Robert C. Ogden of New York, the leader of the conference, Dr. Dabney outlined plans of organization by which the people of the entire South could be reached through the daily and weekly papers, and through addresses in every nook and cranny of the South. These plans were adopted; the Conference was brought down from the clouds to earth. The expenses of the agitation for the enlightenment of the people were underwritten by philanthropists of the North and the South.

"The response was phenomenal throughout the South -- and it was permanent. Out of it came the great gifts of John D. Rockfeller, through the General Education Board -- gifts which eventually encircled the world. The writer has recently seen a letter written by one of the great leaders in the educational movement, in which he wrote to Dr.

Dabney, 'Your address at the Conference in Winston-Salem was a turning point in the history of the South.' At the request of the General Education Board of New York, Dr. Dabney wrote his monumental work, 'Universal Education in the South' in which the story was told of the great awakening of the Southern people and the great and continuing increase in taxes for public education. That Dabney was the only factor in it, no one claims; that he was a very great factor no one disputes. The General Education Board paid the costs for the story of the part that the Conference for Education and the Southern Education Board took in the great awakening; but believing that this story would be greatly enhanced in value if the background of public education was given, beginning with colonial days, Dr. Dabney at very considerable personal expense, wrote the whole -- and definitive -- story.

"In accomplishing such results in the South, it should be borne in mind that at least one-half of his energies had to be expended to induce a conservative people, out of their poverty, to increase their taxes manifold." 3/

In recognition of his services to public education in the South and other scholarly activities Dr. Dabney was honored by the following institutions of higher learning: Davidson College in 1889, Washington and Lee University in 1900, Yale University in 1901, Johns Hopkins University in 1902, and the University of Cincinnati in 1937. Each conferred the Doctor of Laws Degree.

In 1908 he was made a member of the Institute of Public Instruction of France, for having promoted French Literature and in 1915 he was made chevalier of the Legion of Honor, for cooperating with the Alliance Francaise.

In retrospect these are the potentials of the young man who served as the second Director of the North Carolina Experiment and Fertilizer Control Station 1880-87.

The Administrator

In his various administrative functions Dr. Dabney had

3/ The Record of the Hampden-Sydney Alumni Association, Vol. 19, No. 4, July, 1945.

the faculty of adapting his control and procedures to the organization and personnel requirements and to his responsibilities toward the public. He had made an effective appearance before committees of Congress in behalf of the passage of the Hatch Act, the first source of Federal funds available to the Stations. His relationship with his first technical staff in North Carolina was that of a leader rather than director. In later years one of these men spoke very warmly of this relationship. 4/

We are also indebted to Dr. Eggleston for an excellent appraisal of Dr. Dabney's administrative ability.

"Dabney's work in North Carolina became known in Tennessee, and a committee of the Board of Trustees of the University of the State visited him in 1887 and asked him to become professor of agricultural chemistry and Director of the Tennessee Experiment Station. Visiting the institution, and making a thorough study of the conditions then existing, he told the Board that he could not accept the offer unless he was permitted to make changes that would be drastic. The institution was in politics up to its eyes; with Federal funds (under the Morrill Act) for the development of agriculture and the mechanic arts, neither was being developed, and the Negroes were getting nothing. The faculty was in large measure incompetent. There were 125 students; of whom 50 were in a preparatory department; the medical school was a farce. So far from being rebuffed or insulted by those statements the Board offered him the Presidency of the University, in addition to the positions already tendered him. He agreed to assume these responsibilities on condition that he be granted practically unlimited authority to make changes, and reorganize the entire plant. He became President and held the three positions (President, station director, chemistry professor) 1887-90 and the Presidency 1887-1904. It was not easy going.

"In this period the college standards inaugurated; a competent faculty had been installed; the Negroes were given their proper share of the Federal funds; the number

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4/ Address of H. B. Battle before the 50th anniversary of the Station in 1928. Files of the Archives of N. C. State University Library in Raleigh.

of professors had grown from six to twenty-two and the instructors from six to seventeen; the preparatory department had been abolished and the student body had grown seven fold; and this in the face of few standard high schools. Dr. Dabney's transformation of conditions at the University had attracted national attention. In an editorial in The Outlook published in New York, Dr. Lyman Abbott spoke in high terms of the remarkable work done by President Dabney at the University of Tennessee.'' 5/

While serving as President of the University of Tennessee Dr. Dabney accepted President Cleveland's appointment as Assistant Secretary of Agriculture and was granted temporary leave from the University. When McKinley succeeded Cleveland as President, he invited Dr. Dabney to remain as Assistant Secretary, and as an added inducement the appointment carried the title Director of Scientific Research with continuing status when new administrations came into office. One action of the Assistant Secretary marks him as a good administrator. The act is covered in a letter of transmital for the publication of the manuscript of Farmers Bulletin No. 20. It reads:

U. S. Department of Agriculture
Farmers Bulletin No. 20

> Washed Soils: How to Prevent and Reclaim Them Published by the authority of the Secretary of Agriculture, U. S. Department of Agriculture, Office of Assistant Secretary, Washington D. C. Oct. 27, 1894.
>
> Sir:
>
> In accordance with your direction I have the honor to transmit herewith for publication a bulletin upon ''Washed Soils: How to Prevent and Reclaim Them,'' prepared under my direction, by the Divisions of Chemistry, Soils, Forestry, and Botany for one of the series of Farmers Bulletins of the Department.

5/ The Record of the Hampden-Sydney Alumni Association, Vol. 19, No. 4, July, 1945.

> Thousands of acres of land in this country are abandoned every year because the surface has been washed and gullied beyond the possibility of profitable cultivation. It is believed that the present bulletin, and the simple facts therein presented as to how this erosion, or washing may be prevented, and how washed and abandoned lands may be reclaimed will serve a useful purpose in the hands of the farmers who have these trying problems to contend with.
>
> Very respectfully,
> Charles W. Dabney
> Assistant Secretary

The subject was certainly timely and I am sure the preparation of this bulletin by four separate Divisions of the Department required considerable administrative encouragement if not direction by the Assistant Secretary. Dabney chose to return to the University of Tennessee at the close of the Cleveland Administration.

While still at the University of Tennessee (1904) Dr. Dabney was invited to become the President of the University of Cincinnati, an institution established by the Municipal University Act of the Ohio Legislature in 1870. It was proposed that he would build up the then existing University, to weld other institutions into its corporate body; to found within the University a college of engineering and commerce and a college for teachers.

He made a thorough study of the conditions and found that bad management and municipal politics had greatly crippled the University. He wrote to friends asking their opinion as to his accepting the position. Some advised him not to undertake it; others advised him to accept the challenge, which he did.

The new president succeeded in securing a mill tax to improve the financial status for maintenance and by vote of the people, bonds were issued for the erection of many of the university buildings. By steering the university free of politics he was able to secure large grants from the wealthier families of the city.

During his tenure as President of the University of

Cincinnati (1904-1920) the student body rose from a few hundred to about 3,500 for day classes and 2,000 for the evening classes which he started.

Dabney was an administrator who led from friendly constructive ideas that did not permit shallow compromise.

The Scientist

Charles William Dabney became Director of the North Carolina Agricultural and Fertilizer Control Station in November 1880. He succeeded Dr. Albert R. Ledoux the first director who had served since 1877. Dr. Dabney in his usual good grace and courteous manner paid this tribute to his predecessor:

"Under his wise and energetic management the Station attained an early and eminent position of usefulness. As soon as its practical workings were successfully illustrated, the thinking farmers rallied to its support and its influence was rapidly extended.

"The publications of the Station during his tenure are over seven hundred pages, and some thirty thousand copies of reports, bulletins, etc. have been distributed. Besides these numerous contributions have been made to the papers of the State which almost uniformly with great courtesy published our analyses, reports and bulletins.

"Dr. Ledoux had started the work of the Station in spite of many difficulties. The University of North Carolina was very poor. The buildings were limited and out of repair. In spite of poor accomodations in the half basement room in an old building, and in spite of the small appropriations, particularly the very small salaries paid, Dr. Ledoux did a very valuable work and established the Station in the good opinion of the people of the state. His greatest success was in securing good men. How he did it with such small salaries is hard to understand at the present time. Two of them were trained chemists, and the future records of Philips and Battle showed what stuff they were made of.

"Ledoux made himself useful at the University, and was respected by all who knew him. Considering the meager facilities and the small funds available, it was not surprising, however, that after two years struggle he gave up the position and returned to New York to establish a private chemical laboratory where for many years he carried on a very successful business, doing a great deal to develop the resources and interests of the country.'' 6/

The change in the Station administration required no reorganization. Dr. Dabney simply stepped in where Dr. Ledoux left off. One new assistant was appointed and one of the former employes continued with the staff. The general functions of the Station were prescribed by law:

''The analysis of all fertilizers legally on sale in the State.

The analysis of agricultural chemicals, of composts, and home made fertilizers and materials from which they are made.

The analysis of soils, marls and mucks.

The analysis of feeding stuffs.

The examination of seeds.

The examination of grasses and weeds.

The study of insects injurious to vegetation.

The analysis of minerals, ores, and mineral waters, for the State Geologist.

The analysis of drinking water, articles of food, etc. for the State Board of Health.

Practical experiments upon different crops, with different manures.''

This was the starting point for the new station director and his two assistants. Dr. Dabney sought to extend the work of the Station through correspondence with leading farmers. Inquiry by farmers was encouraged. Some of their questions could be answered directly and others were treated by suggesting farm experiments. Several schemes for field experiments on cotton were carried out by farmers working under the direction of a member of the Station staff. They were given instructions as to how to lay out and prepare their land, mix the different chemicals, conduct the experiments, and report the results. There were no

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6/ Address of Charles William Dabney before the 50th anniversary celebration of the North Carolina Experiment Station. Files of Archives in N. C. State University Library in Raleigh. Throughout the remainder of this publication there will be quotations from this address and from bulletins printed while Dabney was director.

field workers or extension staff to help conduct these experiments and demonstrations.

The Station staff was not only engaged in fertilizer control work to protect farmers from fraud but considered it their duty to help the fertilizer manufacturers produce a better product. An excerpt from one of the reports illustrated this point: "For the first time during the past few weeks, we have found such an amount of inferior ammoniates in fertilizer sold in the State as to render it certain it was put there purposely. It is against the beginning of a questionable practice that we wish to speak a warning.

"This is the object of this paper, to caution manufacturers about using these articles in preparing their products and to put farmers on guard in buying them. Against these we desire to utter a decided protest."

There were many occasions to advise manufacturers for the benefit of their products, though the full force of the law was used when necessary.

One of the major projects of the Station initiated in 1881 concerned the chemistry of the cotton plant and its application to farm practice. Analyses were reported of the mineral content of the plant roots, burrs, leaves, stems seed and lint.

Attention was called to the relative exhaustion of plant nutrients by cotton, wheat and tobacco: "Twenty bushels of wheat contains phosphoric acid 10 pounds, potash seven pounds, and lime seven-tenths of a pound. One thousand pounds of tobacco contain of phosphoric acid 9.64 pounds, of potash 65.76 pounds, and of lime 88.80 pounds. The cotton planter has a great advantage over the grain or tobacco grower, and it would appear inexcusable if he cultivates land in cotton so as to exhaust it." This project was a pioneering approach and the application of the results was unique at the time.

Sources of fertilizing materials were studied as a means of utilizing native materials and reducing the costs of plant food to the farmers. "Phosphate marls, or so called caprolites; that is marls containing nodules forming a conglomerate occurring in the southeastern part of the state particularly in Duplin, Onslow, Pender and New Hanover Counties were explored and analyzed by the method of separating the nodules and acid phosphate made from them; nearly one hundred samples were examined in various ways.

"In addition we have explored extensive beds of phosphates and marls mixed together occurring in New Hanover and Pender Counties. This material was tried on various crops last year with encouraging results."

One hundred and thirty-seven analyses of phosphates were made at the Station for the regular phosphate survey and 30 for property owners. A bulletin titled North Carolina Phosphates was published in 1884.

Rock phosphate manufactured into superphosphate in Wilmington produced a material with a total phosphoric acid content of about 12 per cent. It was found that it required less sulphuric acid to dissolve this phosphate than was required for the Florida phosphates. Field trials gave the same results the researchers were getting from superphosphate manufactured from South Carolina and other rocks.

Dabney reported that many richer phosphates had been found in Florida and Tennessee and it had not become necessary to develop the North Carolina phosphates at that time. But he speculated that the North Carolina phosphate beds might be "a great resource in the future when those other beds are more or less exhausted."

The exploration and study of North Carolina pyrites was also a part of this program. Sulphuric acid was needed to render phosphate rock soluble and pyrites were needed for the manufacture of sulphuric acid. For this purpose Mr. Arthur Winslow, an engineering geologist, was hired. The mining of pyrites had been carried out on a large scale in the neighborhood of Murphy and Ducktown, Tennessee. These deposits extended through North Carolina. The area around High Shoals in Gaston County received chief attention. It was reported, in conclusion, that the value of North Carolina pyrites depended upon the quality and purity of the ore and upon the quantity assured and available.

Possible sources of nitrogen were taken up and the refuse of various industries were examined. The purpose of this study was to find some source which would derive the ammoniates needed. It was estimated that in 1883 some 50,000 tons of ammoniated fertilizers were sold in the state and these contained at least 12,000 tons of ammoniates costing the manufacturers $30 to $50 per ton.

Products of abattoirs were investigated and the meat producers of the state were urged to take better care of their offal prepared for use in fertilizers. The utilization of dead animals for the same purpose was recommended. "Of still more importance to us is the utilization of our fish offal to best advantage. Dr. W. M. Kapehart estimates that waste of offal on Albemarle Sound amounts to 2,500 tons per annum. There are immense numbers of fish obtained in every haul which are commercially valueless. The refuse fish and the entrails, cutting and cleaning of those salted down make valuable fertilizing materials which are used more or less in the vicinity, but would need drying or rather manipulation to render it merchantable produce. Specimen of these collected and analyzed were found to have 12% of ammonia and nearly 20% of phosphate."

Sources of potash were also studied and evaluated for farm use. An extensive study was made of kainite which was just being introduced into North Carolina at this time. Tests were made in the laboratory and in the field. Field test included cotton, cowpeas, clover and grasses, Irish and sweet potatoes and rice.

"Experiments with kainite on rust of cotton...were conducted. It is now the quite general opinion that kainite will prevent rust in cotton, in the great majority of instances at least. Otherwise there is hardly a doubt expressed but that kainite can be used in combination with other manures in such a way as to effectually prevent rust and the shedding of the bolls.

"Kainite has been found useful as a dressing upon bottom land containing much vegetable matter and an ingredient of compost to be used for corn upon sandy upland.

"Kainite and peas together is undoubtedly the most promising agent we know for improving our southern soils. They seem to be peculiarly adapted to the soil and to go together. It appears now that kainite is a manure particularly fitted to make a good crop of them where they fail otherwise.

"On clover and grasses the results are also favorable. The very distinct and important effect of kainite is to repress the growth of weeds and the coarser grasses in meadows. Kainite with lime did best on clover. On meadows kainite did best in combination with superphosphate and ammonia. It improves the quality of the grasses upon the sour, wet spots and appears to accomplish for a time the

THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION

Raleigh, Mch., 31, 1886

J. C. Cooper Esq.,
Dobson, N. C.

Dear Sir:

I am glad to have a letter from you again and to see the same old energetic spirit is still in you strong.

You have not been to see us yet. Expected you would come down to the State exposition.

So far from market your chance to get the effect of lime is from ashes. Good hard wood ashes are over one-half lime, which is when fresh the same as that contained in rock-lime. Then you have in ashes a lot of potash, phosphate and other good things besides.

See report for 1881 page 47-8.

You could safely apply 20 bushels of lime to the acre; but I do not know that it would pay you. Use ten bushels. In a race of the kind you propose you must pay especial attention to these points.

1st. Break up deap. So as to be prepared to stand a drought.

2nd. Use just as much wood's mould, or well

Dabney dealt with farmers in a friendly way, as illustrated by the letter reproduced on these two pages. This letter, rotted vegetable matter of any kind as you can get and mix with your strong manure.

3rd. Make your manure as complex as you can. Do not put it all right under the plant, but broadcast a part, put some more under the plant as you say and then put the rest around the corn before the second plowing - that is after you throw the dirt away from the corn and just before throwing it back again.

Mix the good things you can get in the manure. On that sort of land, if you will put in enough rotten vegetable matter, (which should be fine, not course) you can pile in the chemicals without much fear.

If you have a fertilizer in mind, here is a mixture for this occasion.

Acid phosphate	800 pounds
bone meal	560 "
sulphate amonia	100 "
nitrate soda	40 "
kainite	500 "

Mix most thoroughly.
Wishing you success.

Your friend,

(Signed) Chas. W. Dabney, Jr

Director

in response to an inquiry from farmer J. C. Cooper at Dobson, N. C. illustrates this characteristic of Dabney.

same results as a thorough drainage would accomplish, though it will not take the place of this permanently.

"Kainite and peas, followed by compost with acid phosphate promise to do just as great work for the upland as marl and kainite for the lowlands. The manure must be more complete upon these soils. It is generally necessary to add all the elements of plant food to these very thin lands, but perserverance in this scheme will in time make fruitful fields of many of the sand barrens."

Other sources of potash were also examined. Wood ashes, both oak and pine were studied separately, as was dogwood and poplar, and the ashes of cotton seed hulls.

Some of the duties prescribed by law became somewhat irksome to a staff interested in research: "The collecting of minerals, ores, building stone, for exhibits made by the state in Boston, Atlanta, New Orleans occupied more and more time of the State officers during the years 1882-84 inclusive so that we find a hundred and fifty five analyses and assays made for the Geological Survey, with fifty four mineral waters, and twelve specimen of coal."

The establishment of a small station farm in 1886 was considered the greatest good fortune that had come to the Station since its beginning in 1877. In each of the previous years of his tenure Dr. Dabney requested land to fulfill one of the primary purposes of the Station -- to conduct practical experiments upon different crops, with different manures."

Up to 1884 all of the field experiments had been made on private farms by the cooperation of farmers on soil selected for that purpose. In the report of 1884 the director pleaded for an experiment farm. The originating law provided that he should carry on experiments on the nutrition and growth of plants to determine what fertilizers were best suited to the various crops of the state, and whether other crops might not be advantageously grown on its soils.

"We believe that the time has now arrived when this work can and ought to be started," Dabney stated. "Our other arrangements are all complete. The expenditures upon the expositions are supposed to be at an end. Our people expect progress of us. We have no right to stand back from any work which we are thus directed to do, and which will tend to promote progress in the state.

"There are thousands of questions which call for careful, scientific investigation. These problems require special training on the part of experimenters, and they require time, care and money which the ordinary farmer cannot command. These results are for the general benefits and it is the duty of the state to provide for them.

"We in North Carolina have our own peculiar problems connected with our own special crops. There are questions of greatest importance connected with cotton, tobacco, and corn, which demand our attention and it is not probable that anybody can or will solve them for us.

"We urge upon you the investment of a moderate amount in an experimental farm again as a means of turning our present investment in the chemical laboratory to better account. Theory and practice go hand in hand in the natural sciences. Our experiments in the laboratory are necessarily much limited, if we cannot test them in practice. If we had an associated farm, our laboratory work would be able to expand into far greater usefulness. We would then be able to unite the two great motors of scientific progress, hypothesis and experiment, in one effort for the advancement of our agriculture."

The experiment farm was located northwest of Raleigh at the State Fairgrounds. The State Agricultural Society gave about 25 acres and the Board of Agriculture purchased 10 acres additional at $50.00 per acre. The soil was described as being "poor and thirsty, but it is in many respects well adapted to the purposes of the experiment."

Mr. Milton Whitney was appointed superintendent of the farm and work of preparing was begun April 1, 1877. (Whitney was later appointed Chief of the Bureau of Soils of the United States Department of Agriculture when it was founded and devoted his entire life to the development of that great Bureau.) Convicts from the nearby State Penitentiary assisted with grubbing and grading.

The Act of 1877 had provided for a complete agricultural experiment station, as well as a fertilizer control station. The station commenced to be a complete one with the provision of a small experimental farm located on land just west of the State Fairgrounds. This experiment farm made the institution for the first time the complete thing which the Act of 1877, establishing it, contemplated.

Dabney wrote at great length to point out that the addition of land to the Station did not mean that the Station would run a "model farm." "No more land will be cultivated than is absolutely necessary for obtaining accurate results, and not a dollar will be spent for ornament or for show."

He predicted that "North Carolina farmers will rejoice at this step of progress and it is to be hoped that the Station, in its complete form, will receive their renewed support and encouragement."

The first year's field experiments at the farm included pasture and hay grasses, varieties of cotton and new forage crops like millet, maize and especially on the improvement of poor soils with cow peas.

Professor Whitney commenced a series of studies on the physical properties of the soil. Very little had been done on this subject before. The results of his studies pointed to the need for studies of physical and biological characteristics of the soil and these properties correlated with chemical studies.

Also in 1886 a weather station was added to the station.

Among the earliest plans for work at the experiment farm had been a series of observations upon the temperature, at different depths in the soil, in connection with the usual observations of air temperature, rainfall, etc. Dabney said, "A few months study increased our interest in it, and established our purpose to prosecute the observations for a series of years. This suggested the desirability of having a man who could devote his time to this and similar work, and application to the Chief Signal Officer was accordingly made by the Board of Agriculture by resolution at the July (1886) meeting asking for a weather station at the farm."

It was in this way that the State Weather Service became connected with the Experiment Station. Mr. W. O. Bailey, an experienced observer of the U.S. Signal Corps, was stationed here, and the weather station started operations at the experiment farm on December 1, 1886. The meterological work conducted at the farm included studies of the air and soil temperatures, the moisture in the soil, and a record of sunshine.

The weather work developed into a State Weather

Service with the main objective being the collection of accurate detailed weather statistics for the territory of North Carolina, and the dissemination of practical information, weather "indicators," and frost and cold wave warnings.

At the January meeting of 1887 the Board of Agriculture proposed a challenge to Dr. Dabney and his crew. They were "directed to see how much cotton, Indian corn, and tobacco could be raised on one-tenth of an acre of land." In preparation for this test, no previous work was more carefully planned, a liberal quantity of fertilizers and compost was applied. The yields were disappointing. The results were reported and the director concluded that factors other than high fertility were involved and renewed his efforts to find them.

One of the earliest experiments on the development of root systems of plants was started at this station in 1887. Roots of cotton plants were washed out, exposed, measured, and photographed for the purpose of ascertaining their relation to soils and the general development of the plant, the influence of culture, fertilizers, etc. upon their development. The rooting habits of the tobacco plant were also studied and compared with cotton.

North Carolina was considered a row-crop state at this time, but there was some type of livestock on almost every farm. There is no evidence that any experiments with livestock were carried out during Dr. Dabney's tenure as director of the Station. But considerable work was done with crops grown in the state to determine their value as livestock feed.

A number of farmers were trying ensilage, primarily as a means of saving green crops such as pea vines and sweet potato vines which could not easily be preserved as hay. Corn and rye also received attention as silage material.

The soybean received its first study at this station, as to varieties, soil, fertilizers, cultivation and yield. Chief interest in the bean at this time was as a livestock feed and parts of the plant were compared with cow peas and other fodders.

Cotton seed oil was discussed in the reports, and the establishment of oil mills urged. The use of this oil as a substitute for olive oil and as an ingredient in various preparations was recommended. Dabney stated that "Dr. Wesson, producer of the well-known salad oil, said that he received his first suggestions for this use of cotton seed oil from our report."

As for use, Dabney said "cotton seed meal can be used to best advantage as a feeding stuff. Rich food makes rich manure, and when the animal is fed the meal it is not altogether lost as manure, but merely changed in form. In a section where feeding stuffs are in such demand as in ours, cotton seed kernels and cotton seed meal ought to be much more used than they are, in the rations for cows. Although cotton seed meal cannot be substituted for grain in the best and most rational system of feeding it fills a most important place. It is a highly nitrogenous feed that answers a specific and very important purpose. Like the other oil cakes, cotton seed meal should be used to supplement the grains and fodders yielding an excess of starch and celulose alone."

By-products of the rice industry, which still persisted in North Carolina at the time, were studied as to their uses.

Dabney's associates in this work were Dr. H. B. Battle, W. B. Philips, George Warnecke, Frank Dancy, W. F. Brugman, Andrew D. Mickle, Baldwin von Herff and W. A. Withers. Other associates in the Department of Agriculture were Dr. W. C. Kerr, State Geologist; and Mr. T. C. Harris of the museum.

Dr. Dabney served under the administration of Governors Alfred M. Scales and Thomas Jarvis. Col. L. L. Polk was Commissioner of Agriculture. Members of the Board of Agriculture were Col. Thomas M. Holt, President of the State Agricultural Society; Col. Wm. H. Cheek, Master of the State Grange; Patrons of Husbandry, Captain James Thigpen of Edgecombe and Major Jonathan Evans of Cumberland; Kemp P. Battle, President of the State University; and W. C. Kerr, Geologist. For several years Gov. Jarvis, Dr. K. P. Battle and Col. Thomas M. Holt were the executive committee of the Board to whose cordial interest and support he gave due credit.

"The motto on the title page of the report of 1882," Dabney later said, "expressed our principles in all the work done in the experiment station, 'Bleibe bei den Thatsachem – Hold to the facts.' It was taken from the great chemist, Fiedrick Wohler, who with Leibig may be called the father of agricultural chemistry. This motto always has been, and I hope always will be the fundamental rule of all agriculture, as it should be of all scientific investigations.''

The Man

Aside from the educator, administrator and scientist, Dr. Dabney was a warm and friendly individual. And like most men everywhere, there were characteristics or peculiarities that distinguished him as an individual. His father's name was Robert L. Dabney, but he signed all of his public papers Charles W. Dabney, Jr., because of his regard for a great uncle for whom he was named.

Although he had never been a farmer, he felt very close to the farm people he had been hired to serve. He expressed concern on many occasions that farmers were not taking full advantage of the new knowledge being developed through the new station, and that the station could not seek answers to more of their problems.

Perhaps an analysis of the work of the young station at the close of Dabney's tenure would not have revealed a great deal of achievement. But today the North Carolina Agricultural Experiment Station, along with the University of Tennessee and the University of Cincinnati, are all three near the top in their respective fields. Considerable credit for this high achievement must go to the strong foundations laid by this man.

Agricultural Experiment Station

North Carolina State University
at Raleigh

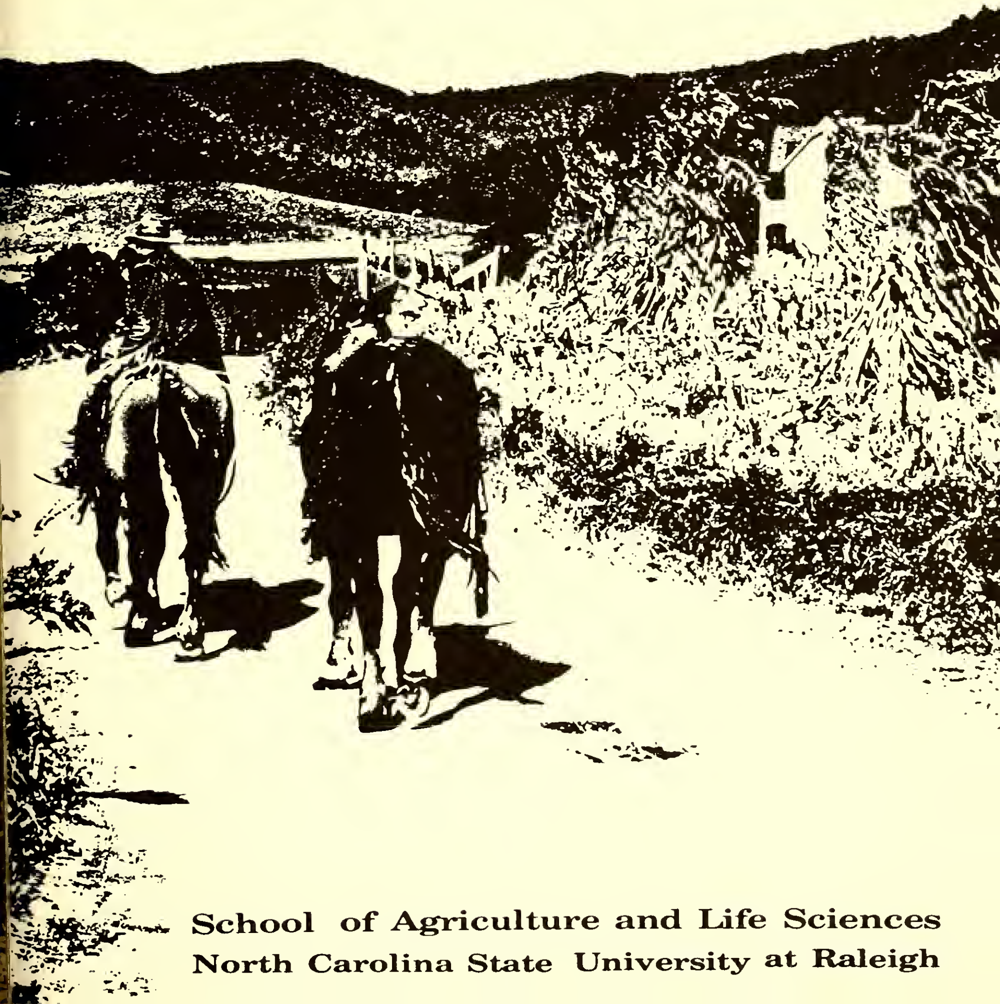
R. L. Lovvorn, Director of Research

Bulletins of this station will be sent free to all citizens of the state who request them.

"Forty Years After"

A Speech by H.B. Battle

History Series No. 3



School of Agriculture and Life Sciences
North Carolina State University at Raleigh

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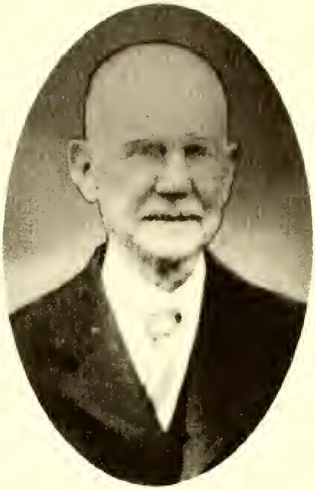
April, 1966



"FORTY YEARS AFTER"

An Address Delivered Before the Semi-Centennial of the North Carolina Agricultural Experiment Station, Apirl 19, 1928

By H. B. Battle, Director, 1887-1897

When I received the cordial invitation of your worthy Director, I feared I could not be present. And, too, owing to the many years which had elapsed, I doubted whether I could bring any words of interest for you to hear. But there persisted an urge within me that could not be set aside, and so I am here, and I am glad that such is the case.

The text of my address may be a little unusual, "Forty Years After." I have chosen it in preference to any detailed account of what happened during the time I was at the Station, because the latter would tire you. Commencing in January, 1881, I served a seven-year apprenticeship under Dr. Dabney, and then was so fortunate as to be chosen to succeed him in the late spring of 1887. I remained here for the ten years following, to the middle of 1897. Although my predecessor on today's program has already paid tribute to the work of those who founded the Experiment Station, I feel that no doubt my own personal contact with them enables me to bring some personal corroboration of what has been said, and present it from another viewpoint, and this comes forty years after.

The origin of the Experiment Station which we are honoring today, in rounding out its half-century of growth, is wrapped up in the life of the University, and its subsequent revival after the Civil War. In the endeavor to devise and create funds for the reopening of the University its friends decided that the best plan was to persuade the legislature to consider the Morrill Fund a debt of honor. This had already been given to each State and accepted by the legislature for the use of the University for the purpose of agricultural education. The money had been received and lost, and should be a debt of honor, and the interest on it be paid to the University, and this would amount to $7,500 annually. It was upon this foundation that the friends of the University labored and finally won after a very hard and bitter fight. With funds from this source, the doors of the University were opened in 1875.

The President of the University was continually studying conditions elsewhere in the hope of finding suggestions that might be followed to advantage. At an early date he was attracted by the Agricultural Experiment Station of Connecticut, and soon decided to recommend a similar plan for North Carolina. This institution in Connecticut was the first in America, and was located at Middletown under the direction of the eminent scientist, Dr. W. O. Atwater, and there the new President went in person to study what was being done. He was very cordially received by Dr. Atwater, and early perceived that it would be very wise to found a similar institution in North Carolina. The object of such work was the application of scientific knowledge to agriculture in the broadest sense. The Experiment Station, too, was not only to make intensive studies of the problems of practical agriculture, but also to supervise in the proper scientific way an industry that was just commencing in America - the fertilizer industry - one that was destined to make tremendous advances. The work of the Germans and the English had already proven its farreaching importance. The growing of crops was found to be vastly aided by the application of artificial plant food in the form of chemical fertilizers, and the kind of plant food, and quantities and combinations were things to call for the closest attention. The industry of commercial fertilizers would prove of immense advantage not only to the manufacturers, but to the farmers who would be benefited by their use. Both parties would be aided, instructed and helped. Also the soils which were to be used must be studied to show what kind of plant food would be needed, also the composition of the crops themselves. All this would be in the direct line of the purpose of the Morrill Act. But there was needed a further step beyond what was provided for in the Act. The authorities in Connecticut early solved this problem in the foundation of an institution totally different from any heretofore formed - The Agricultural Experiment Station. The plan was the first of many others of a similar character soon to follow, as their successful results became known. In this way and through this process, another institution was born in North Carolina, the first in the South, and the second in America. The North Carolina Agricultural Experiment and Fertilizer Control Station, and this was the exact title first given it, thus came into existence on the 19th day of April, 1877, and we are at present at the completion of its fifty years of growth. It is interesting to me to remember, and to present myself now as a witness to bridge over the whole period from one end to the other, since my own father, Kemp Plummer Battle, was the University President referred to, and he has often told me of his visit to Dr. Atwater and of the interesting and valuable experience which resulted from his visit, which was after all the starting point of the life of the Station. Furthermore, just ten years after the time our own Station was founded, and being then in charge of its affairs, I myself took occasion to visit Middletown and search out Dr. Atwater. He very cordially received me, saying he remembered perfectly the visit of my father ten years previously, and he had watched with interest the growth of our Station. Such was my appreciation of his kindly interest and help to us both that a close friendship began between us that did not cease until his death.

The new institution was to be a part of the Department of Agriculture and controlled by its Board, but located at the University. One of the exofficio members of the Board was its President; another was the Master of the State Grange, and then of very wide and influential membership. This was a very wise arrangement, since interesting departments of the several institutions was properly related.

The Experiment Station, located first at the University, remained there through the tenure of office of the first Director, the eminent and very successful scientist, Dr. A. R. Ledoux. He was succeeded in 1880 by our friend, Dr. Dabney, who has already told you of the new institution, and difficulties he found and how he overcame them. The professional training necessary for this was difficult to secure, and few indeed had followed it. The ground work, of course, had to be chemistry as applied to agricultural lines. There was also required a broad understanding of the peculiar problems to be presented, and with the necessary training and ability to solve them.

In the choice of the first and second directors, this Station was fortunate. Dr. Ledoux and his wife, both from the North, early endeared themselves to the people of their adopted homes, and it was with real regret to our people that they decided shortly in the fall of 1880 to turn to their former home in New York. However, Dr. Dabney, a Virginian, bringing his beautiful and accomplished bride from Kentucky, completely filled the place thus made vacant. He soon showed his real worth in the valuable work done by him from the very beginning. He had been in charge only a very short time, when a very important thing happened in my life. Forty-seven years ago, on December 30, 1880, a professional man was writing a letter to a young man in a nearby state. He was stating in no uncertain terms what would be expected in the position being discussed, that no great salary could be given, that other chemists had started there before in similar positions at $30 per month, but owing to certain interruptions to his work, he could not be given more than $20 per month. Since this occurence of many years ago Father Time has been making great changes. Many years afterward the great Baltimore fire completely destroyed the hotel where this letter was written, but it is delightful to contemplate that the two principal actors are still untouched. I am glad to present in the person of Dr. Dabney, seated before you, the one who wrote the letter. The young man who received it, I am happy to say, is now standing before you, and, furthermore, the very letter that was written I now take pleasure in handing to the one who wrote it. And so, I started work in the Experiment Station in January, 1881, under his direction. He will have told you of the partly underground habitation, underneath one of the buildings on the University campus where the Station was located, then consisting of a chemical laboratory in one room, partly lighted and ventilated by transom windows reached with difficulty from the floor. There we remained until the fall of the same year, when a wise purchase by the Board of Agriculture moved us to Raleigh to much better and commodious quarters. The location was the old National Hotel, just north of the Capitol, where the handsome Agricultural Building now is, and remodeled in the interior for the several uses intended, but unchanged on the exterior. In these, in comparison with what we had previously, we were happy indeed. I shall always consider myself fortunate in being able to start my life work under Dr. Dabney's direction, and it was always a pleasure to work under him. Wise, considerate, thoughtful, he was much liked by all who were with him, and we soon grew to recognize his great ability, training and successful handling of the problems that were presented. He early showed himself a true scientist destined to become well known and of wide influence not only in our state but throughout the country. His success in North Carolina showed the possibilities of the future and wherever he was called he proved his worth. Beginning from the time he left us in 1887, he became president of a very important educational institution in a neighboring state, the University of Tennessee at Knoxville, together with the Experiment Station located there.

During the first ten years of its life, from 1877 to 1887, our Station had received its support entirely from the tax on fertilizers imposed for the inspection and analyses, and other purposes connected therewith. About this time the Hatch Act was being considered to appropriate $15,000 for agricultural experiments in each state, to be located at such places as the state might designate. I can thank Dr. Dabney for early inducing the State legislature, then in session, to accept in advance the grant so bestowed for the benefit of our Station, as well as for his influential help in getting the Hatch Act passed. In due time the Hatch Act became a law and we began to arrange our plans accordingly. For some reason, however, the first quarterly payment of $3,750, when due, was not promptly paid, nor could correspondence unravel the difficulty. This extended also beyond the time for the second payment, and so it seemed desirable for a personal visit to Washington. You will believe it or not, but I can testify of the truth, that with all the red tape of official regulations, unnecessary requirements, etc., that in six hours after I arrived in Washington I walked out of the Treasury Building with a check for $7,500 in my pocket payable to our State Treasurer, and the next morning it was safely in his hands and placed to the credit of the Station. What influence helped me? I need mention only one name and you have the answer, and that name is "Senator Ransom." A few words from him to the proper man of what he wanted, helped by two of my personal friends, fortunately in the Treasury Building, caused me to turn the trick. I venture to say that such a thing has never happened before nor since.

With such decided additions to our income we were able to enlarge our operations to include new lines of work. The experimental farm of ten acres, purchased during Dr. Dabney's time, had been located adjoining the State Fair grounds where visitors to the State Fair could examine the various field experiments, feeding tests, crops grown, and other experiments being carried on. Milton Whitney, who had already commenced very important soil tests, resigned shortly after, removing finally to Washington to the Division of Soils, of the United States Department of Agriculture. He handled this with such skill that it eventually grew into a separate Bureau. Since that time nearly every county in the United States has been thoroughly studied and mapped under his original plans, the first thoughts originating at this Station.

The agricultural work was first in charge of J. R. Chamberlain, who subsequently became Professor of Agriculture in the College, his place being well filled by Frank E. Emery. Among other special work conducted was in stock feeding, and at that early date important tests were carried on with cottonseed meal and hulls, with many valuable and important results.

There was also established a Division of Botany and Entomology, and Gerald McCarthy was placed in charge. His work was quite satisfactory and his seed testing investigations particularly, were carried to a very successful conclusion. This work being the first of the kind, attracted wide attention. There was a poultry division, and F. E. Hege, a well known poultry fancier, secured satisfactory results. The cooperation of the State Weather Service with the United States Department of Agriculture was continued. Among others we issued a very complete work entitled, "The Climatology of North Carolina," with all weather records in North Carolina from the very earliest times. This remained a standard work for many years. We instituted also the plan of comparative fertilizer tests on growing crops in several different localities throughout the state in cooperation with prominent farmers and organizations in each locality. This attracted widespread interest, and was repeated during several succeeding years. In after years such tests have been extended to become the magnificent test farms which you have at the present time. We also assisted in founding (in cooperation with the North Carolina Horticultural Society) the Experimental Farms located at Southern Pines. These were planned and conducted on a very broad scale. As a very important part of our problems, we considered it very desirable to carry the information about our work to farmers and others. Consequently, a very complete system of bulletins and reports was instituted. Also a new departure under the name of Press Bulletins was instituted, which proved of great value to newspapers and readers.

Soon after this the World's Fair in Chicago was to take place, the 400th anniversary of the discovery of America by Columbus. Long preparatory months were necessary to get the exhibits together, and, as usual, it was decided that we should have an important exhibit there. It fell to my share to collect and arrange as great a display of grains as possible, including corn, wheat, oats, rye, barley, buckwheat, and others. This was done in cooperation with the United States Department of Agriculture, and we were able to bring together the most notable display of grain crops ever collected from North Carolina, and equalled, if not surpassed, those of most other states and attracted great attention. It was one that surprised even our own people, since it was not thought possible that North Carolina could grow the magnificent grain so generously displayed from such a wide area. As no institution was allowed to enter exhibits for competition under its own name, it was entered personally under mine. In due time, the great news came back that we had been awarded a special medal for excellence. This medal has been carefully kept by me as one of my most valued possessions. However, I think it rightfully belongs in the archives of the Experiment Station, and accordingly I am bringing it today to Dr. Winters, with the hope that he can find a place for it.

At this time it is proper for me to mention some of those who have worked in the Station in various ways, and to give their names with some reference to their work. To them, what was accomplished of value or importance, a very large share of the praise should be given, and I would not care to detract anything from what is due them. As in warfare, although their names are not heard as often as their commander's, still to the men "behind the guns" the greatest praise should be given, for had they not been there, no war could have been fought nor victory won. The first man "behind the guns" I desire to mention happens not to be a "man" at all, but a lady, and from the time she first came to the Station at my request, to help in the executive offices, she gave her whole life to the job, which she then took over and so ably conducted. Not only during my regime, but in later years, as time and changes naturally occurred, it is a delight to me to think of her holding the same or similar position. Always ready, helpful, intelligent, courageous and with the grasp necessary to look after everything, she never failed in the slightest degree. The Station in my time, and during the years to come after, I am sure, owes her a debt of gratitude which none of us can repay. It is my earnest hope that Miss Mamie Birdsong will continue her helpful influence just as long as she cares to remain.

There have been many others, too, in various divisions of the Station besides those mentioned, who ably assisted during these years, and of whose work I have always been proud. In the chemical division, in addition to the names that Dr. Dabney has mentioned, and referring especially to those I brought into the Station, it gives me pleasure to mention the following, among others:

First of all - Dr. B. W. Kilgore. I persuaded him to come to us from Mississippi soon after I took charge. In every undertaking he has fully measured up to expectations, and more. His capable work has given opportunities for advancement which he has utilized to the fullest degree, and I am glad to note the very successful work he has done in each one of them. Then there is Dr. W.M. Allen, who so advanced from year after year until he is now in full charge of the Division of Food and Oil work, which his own merit created. Dr. C.B. Williams likewise early proved himself, but preferred to change to field work and agronomy, and his success has been very marked. Dr. F. B. Carpenter has succeeded in the important post of Chief Chemist of the Virginia-Carolina Chemical Company, as has Dr. J. R. Harris in the very responsible position of Chief Chemist of the huge Tennessee Coal and Iron Company, with many millions of dollars of responsibility. J. S. Meng removed to New York to become a banker, and R. E. Noble left us to take up medicine, and in after years became in the United States Army the chief assistant to General Gorgas during the World War with the active rank of Major General.

Dr. C. H. Herty, who did special chemical work for us, in after years attained great promise as Professor of Chemistry at the University, President of the American Chemical Society, and other very responsible posts, and is now Chief Chemical advisor of the Allied Chemical Corporations. Then there was lovable Benoni Thorp, whose life at the beginning of his career was cut off by the result of a very unfortunate and regrettable accident during a brief vacation. Our hearts went out to his people in suffering.

There is another person I recall vividly with the greatest pleasure. I can never forget Thomas K. Bruner, that genial, whole-souled gentleman who as Secretary of the Board for many years, so ably handled all of the varied details of his office. His intelligent understanding, his wide and intimate knowledge of the state and its resources, his attractive personality, all combined to enhance his great value and usefulness. He played a most important part in the building of the State Museum, and in each of the several successful exhibits of the state resources at the various expositions and his artistic skill always added greatly to their value. He was always in the forefront in the state's development, and his name should always be held in grateful memory.

Please let me add here a few words of tribute to my dear friend, Dr. Charles William Dabney, who as second Director of the Station decided my life work and gave me my opportunity. For all of the posts he has filled, his training was particularly fitted. A graduate of Hampden-Sydney and the University of Virginia, he later took his Ph.D degree at Gottengen, and afterwards taught at Emory and Henry College. After leaving North Carolina in 1887 he was in Tennessee until 1904, repeating his successes there. Being granted a leave of absence, he was called for five years as Assistant Secretary of Agriculture under Presidents Cleveland and Taft, as Assistant Secretary of Agriculture and Chief of Scientific Bureaus, and he ably filled these important places. From 1904 to 1920 he was called to the position of President of the great University of Cincinnati, and thereafter he has been occupied in the study and development of natural resources of Texas, and other states, and later particularly in oil and in potash. Fortunate indeed was this Station to have had him to mold its destinies, and good fortune guided me to be with him.

In subsequent years I have been greatly pleased to see the large amount of valuable work which has been carried on at the Station, and the many improvements and enlargements which have been made under the directorships of Dr. Kilgore, of Dr. Williams and Dr. Winters. I do not know who is individually responsible for each portion, or how the results were reached, but it is very evident that the latter years of the Station's life in rounding out a half century of growth are full of accomplishments, alike creditable to the actors themselves, and the plans they have pursued. You of North Carolina should be proud of what they have given you, and proud also of the bright promises of the future.

I can but believe that in some degree at least, among other important things that have assisted in the splendid development in North Carolina everywhere so noticeable, that the first fifty years of the life of the Experiment Station have had some contributory share.

Agricultural Experiment Station

North Carolina State University
at Raleigh

R. L. Lovvorn, Director of Research

Bulletins of this station will be sent free to all citizens of the state who request them.

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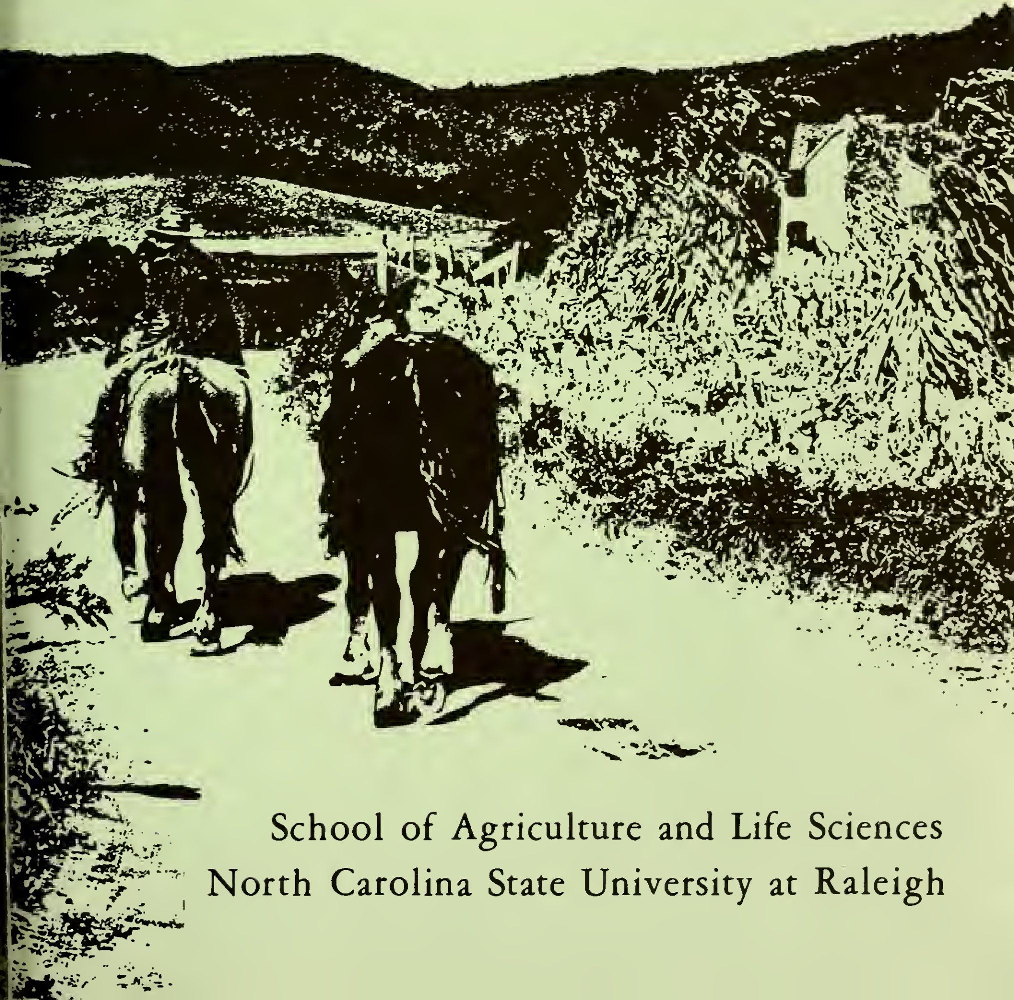

School of Agriculture and Life Sciences
North Carolina State University at Raleigh

EARLY FERTILIZER CONTROL LAWS CHALLENGED BY THE FERTILIZER INDUSTRY

By Dr. Rhett Y. Winters

History Series No. 4

School of Agriculture and Life Sciences
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September, 1967

EARLY FERTILIZER CONTROL LAWS CHALLENGED BY THE FERTILIZER INDUSTRY

An act of the North Carolina General Assembly established the North Carolina Experiment and Fertilizer Control Station in 1877. Among other functions assigned to it was the control of fertilizers sold within the state. The act provided that each manufacturer of fertilizer, offering its product for sale in the state, would pay the Treasurer of the State a license fee of $500 for each brand of fertilizer so offered. The funds thus collected were used to defray the cost of inspection, fertilizer analysis, and other functions specified by the original act and succeeding acts.

Prior to the establishment of the North Carolina Experiment and Fertilizer Control Station and the laws under which it would function had been established, low grade fertilizers denied entry into other states were dumped at North Carolina ports, and farmers had little recourse because of the expense of litigations and the technicalities involved. Low-grade fertilizer was also manufactured in the state.

When the control measures were put into effect, certain fertilizer companies individually and collectively sought to destroy the station. The attack came from several directions.

One of the processors publicly charged that methods used by the State Chemist for the evaluation of fertilizers on the basis of plant food content was useless for the purpose. It was his contention that chemical analysis could not predict the value of fertilizer when used upon a media so complex as the soil and that the value of fertilizer could be measured only by the way it performed in the soil year after year.

Commissioner of Agriculture L. L. Polk met this attack with a strong defense of Dr. Albert R. Ledoux, State Chemist and first director of the N. C. Agricultural Experiment Station. In his report of January 17, 1879 he said:

> The methods used by our chemist for analyzing and determining the merits and the value of these fertilizers are such as are endorsed and practiced by the most eminent chemists of the world, and are

established as truths developed by long years of patient scientific investigation.

It is therefore with pleasure that I commend a defense of these methods as made by Dr. Ledoux in the following pages to the earnest attention of our people, and especially to those of our farmers who were favored with the publication of the Southern Fertilizer Company referred to in it.

It is not for me to attempt to explain why a gentleman justly noted for his intelligence and courtesy should refuse to recongize the professional character of Dr. Ledoux as Mr. Ledoux attached to the Department of Agriculture.

It is due to the learned and able gentlemen comprising our Board and no less than Dr. Ledoux, that I should state that this 'Mr. Ledoux' obtained his earlier chemical education at the school of mines of Columbia College, New York City. He studied organic and Agricultural Chemistry at the University of Berlin, Germany, and the University of Gottingen. He passed his examination at the latter university and received at one and the same time the degree of Master of Arts (MA) and the Doctor of Philosophy (PhD). Since that time he has been connected with a laboratory in New York City, where fertilizer and chemicals are analyzed. He has been elected a member of the German Chemical Society, and the American Association for the Advancement of Science and Art. In addition to the above facts, Dr. Ledoux came strongly recommended by such distinguished men as Dr. A. W. Hoffman, of Berlin, and Drs. Bolton and J. S. Newberry of New York and the Board did not hesitate to engage his services.

L. L. Polk, Commissioner [1]

Dr. Ledoux in writing in defense of the laboratory methods of the Department of Agriculture, State University, Chapel Hill, on May 28, 1878, said:

I had hoped that it would be unnecessary to come

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[1] Commissioner of Agriculture to the Board of Agriculture.

> before the public yet once more, with either an explanation or a defense of methods by which we arrive at a knowledge of the composition and commercial value of a fertilizer. I have on my table before me as I write nearly fifty pages of manuscript and printed matter addressed to myself, to you, and to the people of North Carolina, all over a signature of Col. John Ott, Secretary of the Southern Fertilizer Co., manufacturers of the 'Anchor Brand' fertilizers. These accumulated communications bear the dates all along from June 1877 to January 1878. I have passed them all by, hitherto, in silence, as I did not wish to single out any particular brands. The time has come, however, when the farmers wish me to take some notice of the public assertions of Col. Ott and this I will do as briefly as possible in a communication herewith enclosed.
>
> Yours sincerely,
>
> Albert R. Ledoux

The criticism was directed at the method of evaluating elements of fertilizers. Colonel Ott said, "In the first place, there is one way, and only one way in which the value of fertilizer is to be ascertained and that is by the behavior in the field year after year."

In further defense of his laboratory methods for the evaluation of fertilizers, Dr. Ledoux quoted a letter received by Dr. Thomas Pollard, Commissioner of Agriculture of Virginia, from Dr. Augustus Voelcker of the Analitical Laboratory, 11 Salsbury Square, Fleet St. S. C. London, dated October 6, 1877.

> I am surprised that any reasonable man in your country can entertain the foolish opinion that chemical analysis is of no value whatever to the farmer. I do not think that such an opinion can be entertained by any manure manufacturer with a good conscience. If it were the case that the analysis of fertilizer were useless to the farmer, you may depend upon

> it that manure dealers would make no opposition to the chemical examinations of these productions. It is just for the reason that tricks of the manufacturers trade can only be successfully exposed by a thorough chemical examination, that certain manufacturers are so bitter against analytical tests.

In 1878 a committee of farmers was appointed to study the fertilizer tax. Their report read:

> The committee sincerely hopes so far from abolishing the tax, the General Assembly might, with advantage, to the State, grant increased means of usefulness to the Board of Agriculture. Certainly no legislation in their remembrance has been of such direct value to the agricultural interest, on which chiefly the prosperity of the State depends.

Respectfully submitted:

J. F. Hutchins
Bryson Grimes
Peter E. Smith
R. R. Caldwell
Joseph R. Worth

November 29, 1878

President Battle of the University of North Carolina appointed a committee early in 1870 to petition the Governor and General Assembly to establish the agricultural and fertilizer station. This committee described the fertilizer conditions that indicated the need for a fertilizer control station.

> It is not necessary to go with much detail into proofs that such frauds exist. All intelligent men know the fact from their own experience or the experience of their neighbor. In a trial in the Circuit Court of the United States in this State, it was shown by the State Geologist that more than half of the fertilizer, the subject of the suit, was pure sand, and yet the court held that the purchaser was

bound to pay the price agreed. At the Connecticut Experiment Station it was found that an article introduced by an agent at $55.00 per ton would be dear at $5.00. Another valued at $27.00 was hardly worth $4.00, and a third contained elements actually poisonous to vegetation.

Similar frauds have been discovered in other states. North Carolina is more liable to them now because being driven from some states by proper legislation fraudulent articles are forced into those unprotected with such efficient legislation. Only recently as we are creditably informed, a cargo, prohibited from landing in Savannah by the laws of Georgia was immediately transferred to a North Carolina port.

The laws of North Carolina for the prevention of such frauds have not been entirely successful, because of the great aversion of farmers to appeal to the courts for redress of their grievances. The uncertainty of results, the loss of time, the certain expense which cannot be covered by even a favorable verdict, prompt them to submit to impositon. Means must be provided to prevent the evil in order to make protection effectual. Such means can be secured at a cost insignificant compared with the evil sought to be remedied, leading to the enforcement of the law requiring a qualified analysis and attended with other important advantages.

They have been tried in other countries, in Germany, in France, in England, in Austria, in some of the United States and they have enabled farmers to know about fertilizing elements with as much certainty as flour or cloth.

Those means are the establishment of what are known as agricultural experiment and fertilizer control stations, where experts in chemistry, in laboratories provided with suitable apparatus, analyse soils and manures for people, promptly detect and expose fraud, and by regular bulletins inform the people of the results of their labors. It has been found that honorable manufacturers and dealers willingly cooperate with the Stations by authorizing

> them to inspect their wares at all times, without notice. They have been found most useful also, not only in informing the farmers what kind of manures their crops require but also by themselves experimenting on plants and animals have made valuable discoveries in regard to their nutrition and growth. They have so commended themselves to the intelligent agriculturist that they are now considered indespensible in the best communities of Europe and in some of the States of this Union. From the establishment of the first Station in Saxony in 1851 they have rapidly increased to about eighty in number in continental Europe alone. 2/

It was the established policy of the Fertilizer Control Station in administering the fertilizer act to give erring manufacturers the benefit of the doubt as to whether fraud was intended. Some were given a warning and that was sufficient while others continued their fraudulent practices and were willing to take the matter into the courts.

Much more than fertilizer control was involved in their concerted attack by the fertilizer industry as is shown by Board of Agriculture Report of 1888 concerning the period up to January 1, 1889. Other activities of the Board were under fire.

It reports the following amounts have been received by the Board of Agriculture for the purpose of the Agricultural and Mechanical College:

Appropriated 1886 Industrial School*	$ 5000.00
Received 1888 Industrial School	12000.00
Special Appropriation 1888 Industrial School	2000.00
Reserved under resolution of the Board Sec. 1888	9500.00

* Later the Agricultural and Mechanical College

This included almost the entire support of the newly

2/Excerpt from report to the General Assembly. Legislative Papers of the General Assembly of 1876-77 in the State Archieves.

formed Agricultural and Mechanical College.

In addition to fertilizer analyses, there were assays required for the State Geologist. The chemist was required to analyse the contents of internal organs of persons suspected of being poisoned. Under the funds some field tests were conducted. Appropriations were made to aid the white and colored fairs. These uses of the fee connected with fertilizer control became a point of contention between the Department of Agriculture and fertilizer interests since the legal authorization for collecting a fee was stated in the act, "for the necessary expenses of control." Some of the expenditures could not be certified as necessary to control.

When the attempt to discredit the chemist and his methods of evaluating fertilizers failed to destroy the North Carolina Agricultural Experiment and Fertilizer Control Station a new attack was made by the fertilizer interests. They sought to render it ineffective through the courts.

Commissioner Polk reported:

> A combination of certain manufacturers has been formed to contest the constitutionality of the Act (fertilizer tax act) and, earnest efforts have been made to prejudice our farmers against those provisions of the law imposing a tax on fertilizers. While these efforts were for a time successful, yet when our farmers examined the law in all its bearings for themselves, and saw that its faithful enforcement would give them protection against fraud and swindling, while it would in no measure mitigate the interest of honorable manufacturers, they at once came to its defense. The combination still exists, and has instituted proceedings in the Federal Court against our State Treasurer but I have been notified by a prominent company of its withdrawal from the combination and stating its entire satisfaction with the law since investigating its provisions.

He continued by saying that the law provided:

> Each bag, parcel or package, must have stamped

upon it a true chemical analysis of its contents and surely no manufacturer would object to availing himself of his method of assuring the farmer of the true character and value of his goods, especially as it would serve the double purpose of commending it to the buyer, and force competitors in spurious goods to abandon the market. But, as was to be expected, quite a number of manufacturers are opposing it violently. A grand combination is openly forming, chiefly in the City of Baltimore, to test its validity in the United States and to aid their scheme by producing as much discontent as possible at home, they are advancing their prices at the rate of one dollar per ton, to enable them, they say, to pay the $500 privilege tax. When it is remembered that the enormous profits realized by manufacturers justify them in paying to their dealers and agents, the handsome sum of from five to ten dollars per ton, on sales, and this advance of one dollar would to many of them yield $5000, instead of $500, it can be easily seen that it is a mere pretense to bleed more heavily our confiding people.

There is but one way to deal with those who reap all the benefits of our credulity, and resist in this way all our efforts at self-protection and that is not to trade with them. Our purchase of fertilizers amount, by estimation to three million dollars annually, about two thirds of which to the city of Baltimore. There are some manufacturers there and elsewhere, who have paid the tax cheerfully, and have refused to aid combinations in resisting our laws. If you will buy of them only, the trouble will cease. Their names and addresses will be published for your information as soon as the list is completed.

L. L. Polk, Commissioner 3/

In August, 1890, the Circuit Court of the Eastern District of North Carolina, Judges Bond and Seymour, held that

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3/ Report of Agriculture Immigration and Statistics, January 15, 1887. page 17.

section 2190 of the code declaring that no commercial fertilizer should be sold or offered for sale in North Carolina until the manufacturer or importer obtained a license from the treasurer of the State, for which should be charged a privilege tax of five hundred dollars per annum for each separate brand was in violation of the Federal Constitution and void. This was a suit brought by the American Fertilizer Co. against the Board of Agriculture of N. C. 4/

This second attempt to destroy the N. C. Experiment and Fertilizer Control Station was, in part, successful for the belligerent fertilizer companies. Immediately after the decision was made the State was flooded with low grade fertilizers hoping to escape inspection.

With one foul and one strike against it, the Board of Agriculture took immediate action in petitioning the General Assembly which was in session at the time of the adverse decision of the Court.

> The Board of Agriculture recommends to the General Assembly the adoption of the tonnage system in lieu of the privilege tax heretofore in operation, and prays your body to enact into law the desired and proposed changes at an early date, so as to enable the board to inspect at once the numerous brands of fertilizer rushed into the State since the rendering of the decision above referred to, and which are now on sale with no guarantee or safeguard for the protection of the farmer...Such a change would involve the collection of a charge of 25 cents per ton for the fiscal year ending November 30, 1891 and twenty cents per ton annually thereafter for the purpose of defraying the expense of insection and analyzation of fertilizer and fertilizing materials also to prevent the introduction of a very low-grade and worthless fertilizer. 5/

The change from the license fee to the tonnage tax increased the administrative functions of control. In the

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4/ 43 Fed. Report 609.

5/ Report of the State Board of Agriculture 1889-90, pp. 10.

case of liecnse fee the State Treasurer collected the fee at the rate of $500 for each brand sold in this state while the tonnage tax had to be collected at the rate of 25 cents per ton. But the antagonistic members of the fertilizer industry were not satisfied; they still wanted their 'pound of flesh', the destruction of the fertilizer control system. In this case the Patapsco Guano Co. was selected to lead the charge.

It was charged that the fertilizer control law was still in conflict with the Federal Constitution and that while the law provided for a fee to cover the expense of inspection the fund so derived was being used for other purposes in addition to those associated with control of fertilizers.

The findings in Patapsco Guano Co. vs. Board of Agriculture of N. C., Circuit Court, Eastern District, N. C., September 24, 1892, are summarized as follows:

1. Constitutional Law - State Inspection Laws. In the absence of any constitutional prohibition, a state has the right under the general powers reserved from the grant of other powers to the federal government, and in the regulation of its internal commerce, and to protect its citizens from fraud, to say that certain articles shall not be sold within its limits without inspection, and also to charge the cost of such inspection upon those offering such articles for sale.

2. Constitutional Law - Inspection Tax - Powers of Federal Courts. A state tonnage tax upon fertilizers to defray inspection expenses will not be declared unconstitutional, simply upon the ground of alleged excess does not manifest a purpose to evade constitutional inhibitions; and a federal court will not go into examination of the question, except for the purpose of deciding whether the tax is only colorably or ostensibly an inspection charge or a charge of a kindred nature.

3. Constitutional Law - Excessive Tax. The tax of 25 cents per ton imposed upon fertilizer by Public Laws N. C. 1891 C.9 (Amending Code Section 2190) to defray the expenses of inspection, is not in itself unreasonable or excessive as to show a purpose to evade the inhibition of the federal constitution against the taxation of imports by the states.

4. Constitutional Law - Repeal of Statute-Revival of Prior Statute. Acts of N. C. 1885 C 308 Section 4 provided

that the Board of Agriculture should apply to the maintenance of an industrial school such parts of its funds as were not needed for the regular work of the Department not to exceed $5000 annually. Pub. Laws 1887 C.410 (amending and re-enacting Code, Section 2190) imposed a privilege tax of $500 on each separate brand of fertilizer sold in the state, and as a substitute for the act of 1885, provided that all the surplus arising from this tax should be turned over, to such industrial school. In 1890 the Act of 1887 was declared unconstitutional as imposing a burden on interstate commerce. 43 Fed. Report 609. Therefore its objectionable features were replaced, and superseded by Pub. Laws 1891 C9. which imposed a charge of 25 cents per ton on fertilizers "for the purpose of defraying the expenses connected with the inspection thereof" therefore held, that the repeal of the Act of 1887 did not revive the Act of 1885 so as to appropriate $5000 of the fertilizer tax to the support of such school and thus raise money for that purpose rather than for the declared purpose of defraying the expenses of inspection.

It was

> The judgment of the court that the injunction heretofore granted be dissolved, the bill dismissed, and the defendant have judgment for costs against plaintiff and its surety on the prosecution bond.
> The court is of the opinion that, under existing legislation there is no appropriation of the proceeds of the tonnage tax directly to the support of the industrial school, now called the "State Agricultural and Mechanical College," or the "North Carolina Industrial Association." If it should be otherwise, however it was not intended, and therefore does not affect the case. Certain appropriations are made, in unrepealed sections of the Code of N. C., from funds of the State Board of Agriculture. For various purposes--such as that, under Section 2196, for the salary of an analyst under Section 2198 to a geological museum; and under some other sections, to various

other purposes. But these appropriations are paid out of the general funds of the State Board of Agriculture which are derived from other sources, as well as from the tonnage tax on fertilizers, given by the Act of 1887 to the State Agriculture College, an annual sum of $10,000 is directed to be paid out of the treasury of the State to such college; and in lieu of the $500 directed to be paid out of the fertilizer tax fund to N. C. Industrial Association an annual appropriation of $500 from the public treasury is made the same. Chapter 338, Laws 1891, makes a provision for the oyster industries of the state from other sources than the fertilizer tax. Chapter 417 Laws 1891 makes an appropriation of $10,000 direct from the treasury to the State geological survey, so that it is evident that the legislature of 1891 repealed all the laws making any substantial diversion of the money to be derived from the tonnage tax on fertilizers to any other purpose than to such as directly or indirectly concerned with the expense of inspection, leaving the real question to the court only whether the tax of 25 cents per ton appears in itself so excessive as to indicate a purpose other than that declared on the face of the law. Upon this question the Court has already declared its opinion. 6/

The litigation by appeal of Patapsco Guano Co. to the Supreme Court lasted as late as May 1898. In the sylabus of the action it was concluded: "In any view the effect of the fertilizer control law on the commerce is indirect and incidental the constitution of the United States does not secure to any one the privilege of defrauding the public."
Decree affirmed. 7/

Mr. Justice Harland and Mr. Justice White dissented.
The Patapsco Guano Co. was represented by Mr. Thomas N. Hill and John W. Hinsdale and the Board of Agriculture was represented by Mr. R. H. Battle, Mr. J. C. L. Harris and Mr. F. H. Busbee.

6/ Federal Reporter Vol. 52, page 690.
7/ Vol. 171 US 345 18 Supreme Court 862 43 Lawyers Edition 191.

We are deeply indebted to Col. L L. Polk, Commissioner of Agriculture, members of the Board of Agriculture, the staff of the North Carolina Experiment and Fertilizer Control Station, and many others who used their influence in defense of these young state institutions that have rendered such valuable service to the State.

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